FIG. 3 illustrates the adjustable stop installed and locked into position upon an endotracheal tube guide 21. The distal end 22 is illustrated with a slight bend, while the proximal end portion is shaped to form a handle in a manner somewhat similar to that disclosed in my U.S. Pat. No. 3,957,055. The tapered portion 15 of resilient cylindrical body 11 faces the distal end 22 of guide 21 and is intended to fit within the standard connector used with the endotracheal tube or catheter guide.

After the adjustable stop has neen positioned upon the endotracheal tube guide 21 to the desired depth of penetration of the distal end 22, the stop is locked into position upon guide 21 and the proximal end 23 is rigidly secured to the adjustable stop by forced insertion of end 23 into the laterally offset hole 19. The forced insertion of proximal end 23 into the smaller diameter hole 19 securely anchors end 23 while causing a deformation in the shape of portion 16 and end surface 13 of cylindrical body 11. The change in shape of portion 16 stretches the cylindrical body 11 to cause the walls of central bore 17 to apply a clamping and holding force upon the surface of guide 21.

Where the opening to a connector used with an endotracheal tube or catheter guide is larger than the diameter of end surface 12 and tapered portion 15, tapered portion 15 and straight portion 16 will extend within the opening to the connector until shoulder portion 14 comes into contact with the mouth of the connnector, thereby limiting the depth of penetration of distal end 22.

Where the opening to an endotracheal tube or catheter is smaller than the diameter of end surface 12 of the adjustable stop, the embodiment illustrated in FIG. 4 may be used. In this version, the proximal end 23 is inserted into lateral hole 18 in the straight portion 15. The forced insertion of proximal end 23 anchors the handle and clamps the stop upon guide 21 in the same manner described above in connection with FIG. 3. Flat end surface 13 of shoulder 14 serves to limit the depth of penetration of distal end 22 upon its contact with the opening to the endotracheal tube or catheter. In this embodiment, the straight portion 16 of body 11 serves as a convenient finger grip for the physician. The preferred embodiment of the invention is, therefore, usable in a number of ways with a variety of sizes and types of endotracheal tubes and catheters.

FIG. 5 illustrates an adjustable stop employing a resilient body 31 in the shape of a ball or sphere and having a first or front surface portion 32 and a rear or second surface portion 33. A central bore 37 extends completely through body 31 between the front and rear surfaces 32 and 33. The diameter of bore 37 is sufficient to permit the stop to slide easily over the surface of guide 21. A laterally displaced hole 39, offset from central bore 37, extends partially into body 31. The diameter of hole 39 is smaller than the diameter of the proximal end 23 of the guide 21.

The adjustable stop of FIG. 5 is installed upon guide 21 in the same manner as described above, and the forced insertion of proximal end 23 into hole 39 anchors the handle and clamps the stop upon the surface of the guide. The diameter of body 31 may be chosen to fit within a standard connector, if desired, or selected for abutment against the open end of the endotracheal tube or catheter.

The improved adjustable stop of this invention applies a strong clamping force upon the surface of the guide to hold and maintain the depth of penetration of the guide as the endotracheal tube or catheter is being intubated, and provides a secure anchor for the proximal end of the guide to form a sturdy and rigid handle.

Since many changes can be made in the above-described apparatus and many different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. An adjustable stop adapted for use with an endotracheal tube guide, comprising in combination:
   (a) a cylindrical body of resilient material having first and second end surfaces;
   (b) a central bore extending coaxially through said cylindrical body between the first and second end surfaces, the diameter of said central bore being sufficient to permit the adjustable stop to slide over the surface of the endotracheal tube guide; and
   (c) at least one hole extending partially into said cylindrical body from one of the first or second end surfaces, said one hole being approximately parallel to and laterally offset from said central bore, the diameter of said one hole being smaller than the diameter of the endotracheal tube guide to permit an expansion of the resilient material about said one hole upon insertion of one end of said endotracheal tube guide therein and thereby provide a clamping force on the tube guide within said central bore.

2. The adjustable stop as defined by claim 1 wherein the first and second end surfaces of said cylindrical body are substantially flat and are perpendicular to the axis of said cylindrical body.

3. The adjustable stop as defined by claim 1 further comprising a shoulder portion formed at one of the first or second end surfaces of said cylindrical body, said shoulder portion extending radially outward from the cylindrical surface of said body.

4. The adjustable stop as defined by claim 3 wherein said shoulder portion is disk-shaped, and wherein the diameter of said disk-shaped shoulder portion is approximately fifty percent larger than the diameter of said cylindrical body.

5. The adjustable stop as defined by claim 1 further comprising an additional hole extending partially into said cylindrical body from the other of the first or second end surfaces, said additional hole being approximately parallel to and laterally offset from said central bore, the diameter of said attitional hole being smaller than the diameter of the endotracheal tube guide.

6. The adjustable stop as defined by claim 5 wherein said one hole and said additional hole are diametrically disposed with respect to said central bore.

7. The adjustable stop as defined by claim 1 wherein said cylindrical body of resilient material includes a tapered portion adjacent one of the first or second end surfaces.

8. An adjustable stop adapted for use with an endotracheal tube guide, comprising in combination:
   (a) A body of resilient material having first and second surfaces;
   (b) a central bore extending through said resilient body between the first and second surfaces, the diameter of said central bore being sufficient to permit the adjustable stop to slide over the surface of the endotracheal tube guide; and